# Programmable pulse counter CIP

## Users Manual

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## 1. INTRODUCTION

The pulse counter $CIP$ is designed to work with Tecfluid's volumetric counters (Covol) and turbines.

The circuit is based on a microprocessor that, in function of the pulses per litre programmed, totalizes the volume that flows through the meter and shows this value on a local indicator.

This instrument is battery powered and doesn't require any wiring. This makes its installation very easy.

## 2. OPERATION

To adapt the counter to the meter, the pulses per litre factor specified on the meter must be programmed. To do this, the plastic front cover must be removed by unscrewing the four screws on the corners. After that, the push buttons will be accessible.

There are three push buttons with the following functions:
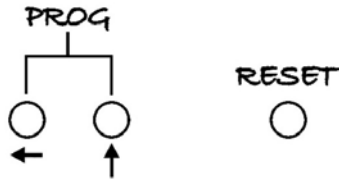


### 2.1. PROGRAMMING

By pushing the two push buttons PROG at the same time for at least two seconds, the display will change to the programming mode. In this mode there are 7 digits (five whole numbers and two decimals). The value that must be introduced is the pulses per litre factor given on the label of the Covol or Turbine. If you wish to totalise in $m^3$ then the pulses per litre must be multiplied by 1000. For example, if the turbine has a pulse per litre value of 21,02 then 21020,00 should be entered in the configuration.



To do this, pushing the push button marked with the arrow pointing upwards, the underlined digit will increase. Once the desired value of the digit is achieved, by pressing the push button marked with the arrow pointing left, the cursor will pass to the next digit to be modified. On the sixth digit, by pressing this push-button the cursor will pass to the first digit on the display.

When the value of the pulses per litre is correct, by pushing the two push buttons PROG at the same time for at least two seconds, this value will be automatically saved in the memory and the counter will return to the normal working mode.

**NOTE**: During the process of programming the pulses per litre, the counter increases its power consumption. In order to optimise the battery life time, if during 30 seconds no push buttons are pushed, the counter return to the normal working mode. In this case the data in the memory will not be changed.

### 2.2. RESET

By pushing the RESET push button during two seconds the counter will be set to zero.

It is possible to reset the counter without removing the plastic front cover by holding a magnet horizontally below the RESET push button during two seconds.

## 3. MAINTENANCE

The battery has a life time of about 5 years. To change the battery, the plastic front cover must be removed. Then the battery, that is situated below the push buttons, can be replaced.

After replacing the battery, it is not necessary to reprogram the pulses per litre factor of the meter.

CR2450 batteries are easily found in the shops. If you prefer, we can change it in our factory.
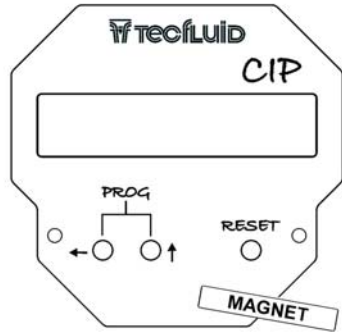


## 4. MEASUREMENT ERROR CORRECTIONS

The calibration of the mechanical flowmeters is made with water at 20 $^o$C to obtain a calibration for a liquid of density 1 kg/l and viscosity of 1 mPa·s. If the flowmeter is used with a liquid of other characteristics from the above specified or for reasons of turbulences in the flow, measurement errors can be induced.

To correct these types of errors we can modify the pulses per litre factor programmed in the instrument.

## 5. CHANGE OF UNITS OF MEASUREMENT

In some cases we need to change the measurement units, for example, instead of working in litres we need to work in kilograms. In this case we will need to know the density of the liquid ($\rho$).

To change from litres to kg we must divide the pulse per litre factor by the density of the liquid to obtain the new factor for programming the $CIP$. For example, if the liquid has a density of 0.9 kg/litre, the meter gives us 200 pulses per litre and we must count in kg, we will program the $CIP$ using 222.222 as the new pulses per litre factor to be able to count directly in kg.

Fk = Pulses per litre factor to count in kilos
F = Original pulses per litre factor
$\rho$ = Density of the liquid in kg/litre

$$F_k = \frac{F}{\rho}$$

## 6. TECHNICAL CHARACTERISTICS

### 6.1. Power supply
CR-2450 lithium battery

| | |
|---|---|
| Nominal voltage: | 3V |
| Capacity: | 560 mAh |
| Power consumption: | 8 µA |

### 6.2. Totalizer

| | |
|---|---|
| No. of digits: | 7 |
| Size of digits: | 8 mm |
| Reset: | By means of push button or magnet. |

### 6.3. General Characteristics

Protection level:         IP65
Working temperature:   0 — +50 ºC

### 6.4 Terminals

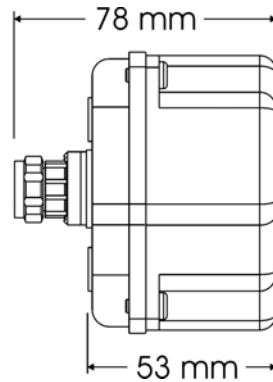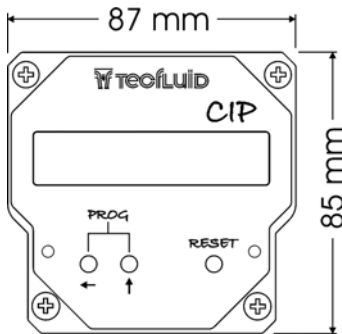| Terminal No. | Covol | Turbine |
|---|---|---|
| 1 | Common | Common |
| 2 | Live | Live |
| 3 | — | Live |

Complies with the Directive EMC 89/336/CEE

Norm EN 50081-1
Norm EN 50082-2

CE

## WARRANTY

Tecfluid S.A. GUARANTEES ALL ITS PRODUCTS FOR A PERIOD OF 12 MONTHS, maximum 18 months after consignment, against all defects in materials and workmanship.

This warranty does not cover failures which can be imputed to misuse, use in an application different to that specified in the order, the result of service or modification by un-authorized persons, bad handling or accident.

This warranty is limited to cover the repair or replacement defective parts which have not been damaged by misuse.

This warranty is limited to the repair of the equipment and all further and eventually following damages are not covered by this warranty.
In the event of consignment of equipment to our factory, this should be done with the equipment well packed and prepaid transport. Tecfluid S.A. will not accept any responsibility for damage done during transport. Together with the equipment, a note should be enclosed indicating the failure observed, the name, address and telephone number of the sender.